REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

None of Ruppel et al (US 5,821,390), Ruppel et al (US 5,739,391) and Etzkorn et al (US 5,198,578) alone or in combination disclose or suggest the claimed process.

The present invention relates to a process for the catalytic gas-phase oxidation of propene to acrylic acid in which **two salt baths, two temperature zones** (the two temperatures being linked by a specific relationship) are used, thus enabling **high reactant loads** without loosing product. Under the claimed temperature structure of the process it is possible to significantly increase the **propene and acrolein load** of the catalysts without suffering significant product losses and thus achieving **a space-time-yield being double and more** compared to that in the prior art. This high space-time yield is achieved in the same reaction tube and with the same amount of catalyst. Twice as much product or more can be produced in the same time compared with using the same catalyst amount in the same tube but under the prior art temperature structure and load.

In contrast, Ruppel et al employ **small reactant loads** in solely **one temperature zone**.

The Examiner has correctly recognized that the maximum load with the **total reaction gas mixture** is 2500 I(s.t.p.)/I/h in both Ruppel et al references.

The propene content in US 5,821,390 is 5.4% (column 8, line 13) and the acrolein content in US 5,739,391 is 4.2% (column 7, line 43). This however automatically means that

the **propene load** in the Examples of Ruppel et al has to be **lower than** (2500:100) -5.4 =**135 I/I/h** and that the **acrolein load** has to be **lower than** (2500:100) -4.2 = **105 I/I/h**. These are completely normal loads and typical for a reactor with solely **one salt bath, one temperature zone**. In contrast, the claimed propene load is ≥ **160 1(S.T.P.) of propene/l of catalyst bed · h**, and the claimed acrolein load is ≥ **140 1(S.T.P.) of acrolein/1 of catalyst bed · h**.

The basic differences between Ruppel et al and the present invention are not the features taken into consideration by the Examiner, but the fact that Ruppel et al employ **small** reactant loads in solely **one** temperature zone, whereas the process according to the present invention uses **two** salt baths and **two** temperature zones (the two temperatures being linked by a specific relationship) thus enabling high reactant loads without loosing product.

The temperature of a zone in the present application is defined as the temperature of the salt bath in absence of any reaction. In practice, exothermic reaction takes place causing a temperature increase of the salt bath from its entrance into the reactor to the outlet of the reactor of about 2 to 10 °C. This however applies in the process according to the present invention for each of the two salt baths (e.g. page 15, lines 29 to 36) flowing independently from each other in one and the same reactor and when entering the reactor having a different entrance temperature defining the temperature of each of the two zones in one and the same reactor.

The statement in Ruppel et al that the temperature with conversion can be **lowered** by 5 to 40°C (see page 8, line 13 of the Office Action) is also not helpful as according to the

invention under dispute the temperature has to be **increased** with conversion and the Examples of the instant application show that already a **temperature maintanance is disadvantageous**.

Similar arguments apply to Etzkorn et al. Etzkorn et al employ in **one** temperature zone only such **small propene load** as **112 I/I/h** (column 13, line 15, total load = 1600 I/I/h, and the propene concentration is 7% (column 12, lines 30 and 54), (7% of 1600 equals 112).

Thus, none of Ruppel et al (US 5,821,390), Ruppel et al (US 5,739,391) and Etzkorn et al (US 5,198,578) alone or in combination disclose or suggest the claimed process. There is no motivation or suggestion to modify the processes of the references to arrive at the claimed invention.

Therefore, the rejection of Claims 1-22, and 27-28 under 35 U.S.C. §103(a) as being unpatentable over Ruppel et al (US 5,821,390) in view of Ruppel et al (US 5,739,391) and Etzkorn et al (US 5,198,578) is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

In addition, the rejection of Claims 1, 23-24, 29, 30-31 under 35 U.S.C. §103(a) as being unpatentable over Ruppel et al (US 5,821,390) in view of Ruppel et al (US 5,739,391), Neumann et al (U.S. 5,364,825) and Etzkorn et al (US 5,198,578) is respectfully traversed.

As 5% of 2400 (see column 6, line 7 of Neumann et al (U.S. 5,364,825)) equals **120**, Neumann et al also applies, like the whole state of the art, **little** reactant load in **one** zone. Thus, Neumann et al does nothing to cure the defects of Ruppel et al (US 5,821,390), Ruppel et al (US 5,739,391), and Etzkorn et al (US 5,198,578), and even a combination of the

references does not result in the claimed invention.

Therefore, the rejection of Claims 1, 23-24, 29, 30-31 under 35 U.S.C. §103(a) as being unpatentable over Ruppel et al (US 5,821,390) in view of Ruppel et al (US 5,739,391), Neumann et al (U.S. 5,364,825) and Etzkorn et al (US 5,198,578) is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

The objection to Claim 23 is obviated by the amendment of Claim 23.

The rejection of Claims 1, 22-23, and 28-29 under 35 U.S.C. §112, first paragraph, is respectfully traversed.

Applicants note that a large number of details regarding catalyst I and catalyst II are disclosed at page 8, line 24 to page 13, line 43 and at page 20, line 7 to page 25, line 10, respectively. In addition, Examples of the catalyst preparation have been provided. These details are sufficient to enable the person of ordinary skill in the art to perform the claimed process without undue experimentation.

Applicants would like to put emphasis on the fact, that the present application claims a process using catalysts which are well-known in the art for a long period of time and which are even described in the references cited by the Examiner (e.g. US - A 2941007, US - A 5739391, US - A 5364825, US - A 6198580 and US - A 5380933).

Also, the suitability of such catalysts for the generic reaction type is well-known in said references and other literature. A lot of further US patents, such as the references cited in the present application, could be mentioned which disclose additional relevant catalysts. That

is, manufacture and applicability of the catalysts recommended in the current application for the process as claimed should be undisputed.

In addition, the present application not only shows Examples in which representative catalysts are used, moreover, the specification specifically names further individual catalyst compositions which are especially favorable in the respective stages (e.g. page 8, line 28 to page 9 or on page 20 in line 19 of the specification).

This detailed disclosure of applicable catalysts certainly is not less than in US - A 5198578 (see column 9, line 8 to 20 of that reference cited by the Examiner) whose disclosure obviously sufficiently enabled the skilled artisan (the Examples of that reference even do not contain any explicit disclosure of the catalyst employed (see column 11, lines 62 following of that reference) which in view of the USPTO was enough for grant.

Furthermore the representative Examples of the present application undisputedly prove that under the claimed temperature structure of the process it is possible to significantly increase the propene and acrolein load of the catalysts without suffering significant product losses and thus achieving **a space-time-yield being double** and more than that in the prior art (in the same reaction tube and with the same amount of catalyst twice as much product can be produced in the same time compared with using the same catalyst amount in the same tube but under the old temperature structure and load).

There is no reason for doubt that aforesaid will not also be the outcome when using other catalysts. Such catalysts or catalyst combinations certainly will not perform identical. That is, some will perform better and others will perform poor. However, when a catalyst or

catalyst combination performs poor it will generally do so under the prior art and under the claimed conditions. Nevertheless, the poorer space-time-yield with a poor performing catalyst or catalyst combination under the claimed process conditions will be about twice as much or more of the poor space-time-yield achievable using the same poor catalyst or catalyst combination under the prior art process conditions. Thus, a person of ordinary skill in the art is clearly enabled to perform the claimed process without undue experimentation. Thus, this rejection should be withdrawn.

Finally, Applicants respectfully request that the Examiner acknowledge that the references cited in the Information Disclosure Statement, filed in the above-identified application on December 10, 2001, have been considered. For the Examiner's convenience a copy of Form PTO 1449 as filed on December 10, 2001, is attached herewith.

Applicants submit that the present application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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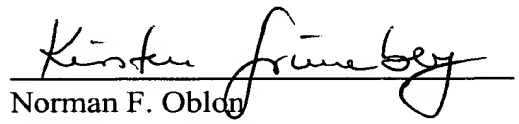

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